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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/801,969	03/16/2004	George Nerubenko	SMB-7038	2364

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EXAMINER

NGUYEN, XUAN LANT

ART UNIT	PAPER NUMBER
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3683

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/801,969

Applicant(s)

NERUBENKO, GEORGE

Examiner

Lan Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 December 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 2-10 and 22-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 11-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The amendment to the specification submitted 12/26/06 has been approved.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 14-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re: claims 14-21, claim 14 states " A method for damping torsional vibrations of a rotating shaft wherein said shaft includes a hub, a mass physically coupled to said hub via a first spring and coupled to said hub via a second spring and electromagnetic bond". It is unclear if Applicant intends to claim mass 714 or mass 750 because: (1) mass 714 is physically coupled to said hub 705 via a first spring 712; (2) mass 750 is coupled to the hub 705 via a second spring 752 and an electromagnet bond 770; and none of mass 714 and mass 750 is physically coupled to said hub via a first spring and coupled to said hub via a second spring and electromagnetic bond. To further prosecution, claim 14 is being treated as having the preamble -- A method for damping torsional vibrations of a rotating shaft wherein said shaft includes a hub, a mass

physically coupled to said hub via a first spring and said mass coupled to a second spring via an electromagnetic bond --.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 11, 12, 14 and 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Tossman et al (USP 3,637,169).

Re: claim 1, Tossman et al. show a damper for mitigating torsional vibrations of a shaft 21, rotating with an angular velocity about a longitudinal axis 11, and rotating perpendicular to a plane of rotation, as in the present invention, comprising: at least one passive damping element 35, one active damping element 14, 15.

Re: claim 11, Tossman et al. show a damper for reducing torsional vibrations of a rotating shaft, as in the present invention, said damper comprising: a first spring 32, a second spring 14, 15, a mass 35 physically coupled to said first spring and electromagnetically coupled to said second spring for oscillation having a frequency, wherein said oscillation dampens said torsional vibrations of said shaft that correspond to said frequency, accelerometers coupled to the mass and the shaft for detecting the relative motion of said mass and said shaft, accelerators are not shown but inherent since Tossman uses the angular momentum, column 3, line 4, and angular

displacement, column 3, lines 64 and 65 in the controlling scheme, a current generator for adjusting an electromagnetic bond hereby the second spring is coupled to the mass, a current generator is not shown but inherent since in column 4, lines 6 and 7, Tossman discloses that the current is fed to the coils 18, a computer coupled to said accelerometers and said current generator for detecting at least one undesired torsional vibration, determining a corresponding dampening spring stiffness improvement, and signaling current generator to adjust current in order to implement said improvement, see column 4, lines 6-16.

Re: claim 12, Tossman shows through out the disclosure that frequency and amplitude of said mass and said shaft oscillation and phase differential between mass and said shaft are calculated in order to damp the rotational frequency of the spacecraft.

Re: claim 14, Tossman et al. show a method for damping torsional vibrations of a rotating shaft 21 wherein said shaft includes a hub 27, a mass 35 physically coupled to said hub via a first spring 32 and said mass coupled to a second spring 14, 15 via an electromagnetic bond, said method comprising: (i) oscillating said mass angularly with respect to said hub in a manner that absorbs energy with a resonance related to the total effective spring constants of the first and second springs, as shown in figures 1 and 2, (ii) identifying undesired harmonic motion in said mass relative to said hub, see column 2, lines 57-62, (iii) calculating applied current changes that, when applied by a current generator to said electromagnetic bond, see column 4, lines 6-16, change the total effective spring constant and improve dampening of the detected undesired harmonic motion, and (iv) applying said current changes, see column 4, lines 6-16.

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Note that the claimed feature "current changes" has been treated broadly in that a plurality of changes of the current from being on to being off is considered to be "current changes".

Re: claim 17, Tossman shows in column 4, lines 6-16 that when electromagnets 14, 15 are energized, they quickly dampen the vibration (i.e. harmonic force with a frequency equal to frequency of actual external force).

Re: claims 18-20, even though Tossman does not show the transducer, accelerometers and frequency detector, they are considered to be inherent in Tossman's system since Tossman discloses the use of angular momentum, column 3, line 4, angular displacement, column 3, lines 64 and 65, rotating frequency, column 3, line 6, in the controlling scheme as described in column 4, lines 6-16 wherein the coils 18 are energized based on the changes in the angular momentum to dampen rotational vibration.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 13 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tossman et al. in view of Wang et al. (USP 6,598,717).

Tossman's damper and method, as rejected in claims 11 and 14 respectively, lack the spectrum analyzer as claimed. Wang et al. teach the use of a spectrum analyzer 130 in figure 10 as an old and well-known device for signal processing. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Tossman's damper and method to have included a spectrum analyzer as taught by Wang since spectrum analyzers are old and well known devices for signal processing.

Allowable Subject Matter

8. Claims 15 and 16 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Response to Arguments

9. Applicant's arguments filed 7/6/05 have been fully considered but they are not persuasive. Examiner's responses are followed. The rejections are maintained based on these reasons; and are repeated above.

- Applicant's argument about the claimed "active damping element" has been found to be non persuasive. Applicant's argument is more specific than the claim language. Since no further details or structures provided for the claimed "active damping element" in claim 1, said claimed feature is treated broadly. Tossman clearly shows elements 14, 15 as an "active damping element".

- Applicant's argument about the 112, 2nd paragraph rejection of claims 14-21 is non persuasive. Mass 714, as argued by Applicant, is coupled to the hub 705 via two paths: (i) the first spring 712 and (ii) the outer ring, spring 752 and the electromagnetic bond from between sheath 770 and ring 714. However, mass 714 is not coupled to the hub 705 via the second path as argued by Applicant. The Examiner maintained that mass 714 is coupled to the hub by only one path via the first spring 712. Applicant argues that paragraph [0044] states that the outer ring 750 is rigidly affixed to hub 705. That is true. This passage simply states the connection between hub 705 and the outer ring 750. It does not state the mass 714 is coupled to the hub 705 **VIA** outer ring 750, spring 752 and the sheath 770.

The entire paragraph [044] is reproduced here to show that there are no disclosures of two paths as argued by the Applicant. "[044] Referring to Figure 7, an arrangement 700 is shown for a self-tuning dual mass wherein the self-tuning is the result of electromagnetic feedback. As with the hub 505 and outer ring 550 of Figure 5, there is a hub 705 rigidly affixed to an outer ring 750. An inner ring 714 is co-centered with the hub 705 and connected by radial cantilever springs 712. The outer ring is connected to cantilever springs 752. These springs 752 are directed radially inward toward the inner ring 714 and terminate in sheaths 770 that surround an arc of the ring 714 (like two inter-linked annuli). Where the sheaths 770 and ring 714 have an applied current, an electromagnetic bond is established between them. Where the currents are varied, the degree of coupling

is adjusted, thus providing for variance in spring forces (springs 712 plus some proportion of springs 752) that effect oscillation of ring 712 about the hub 704.”

- Applicant argues that Tossman does not teach accelerometers in order to meet the claimed features in claim 11. Please see Examiner’s response to this argument previously.
- Applicant argues that Tossman does not show the changes in the current as claimed in claim 14. Claim 14 broadly claims “current changes” without further description of the changes. Hence, the claimed “current changes” have been treated broadly to encompass any changes. When Applicant further specifies the changes as in claims 15 and 16, the changes have been found to define over the prior art of record as indicated above.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Nguyen whose telephone number is (571) 272-7121. The examiner can normally be reached on Monday through Friday, 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James McClellan can be reached on (571) 272-6786. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Xuan Lan Nguyen/ 2-21-07
Primary Examiner
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